Space Weather Forecast

Issued on Tuesday, 25 June 2024 at 13:22 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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GOES16/18 satellite data feeds are currently experiencing a data gap since approximately 24/2120 UTC, as a result our Alerts and Warnings service may experience delays or contain incomplete data.

Space Weather Forecast Headline: Further Moderate class flares likely

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Moderate, with low M-class flares in the past 24 hour, predominately from a sunspot region from over the southwest limb. This has now rotated off the disc, with the main activity switching to the wide region on the southeast disc. This is comprised of string of small spots, including one with mixed polarity regions, but has remained relatively inactive during the last 24 hours. The other regions are all simple unipolar spots.

A large filament, or line of plasma material, was observed lifting off the west disc around 25/0200 UTC, and a CME (coronal mass ejection) has now been observed on some imagery, as an asymmetric partial halo. This may have an Earth-directed component, however preliminary analysis suggests this is a relatively slow CME, with arrival most likely day 4 (28 Jun) or just beyond this period. Analysis is ongoing.

Solar Wind / Geomagnetic Activity: Background slow wind conditions were mainly observed with speeds persisting below 350 km/s. Interplanetary Magnetic Field, was weak, but saw an increase to average around 5-6nT. North-south component was weak, varying between +6 and -6 nT, but favoured a negative (southward) directed from 25/0030 UTC. Geomagnetic activity was Quiet (Kp 0-2).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) has remained at background levels with no solar radiation storms occurring although it showed a slight increase towards the end of the period. Due to the data gap this is based upon the best data at time of issue.

Four-Day Space Weather Forecast Summary

Solar Activity: There is a chance of Further Moderate flares, with a slight chance of isolated Strong class flares. These most likely from either the recently departed sunspots in the far west in the near term, or the main sunspot in the southeast.

Solar Wind / Geomagnetic Activity: There are two CMEs of note. A weak enhancement is possible late day 3 or early day 4 (27-28 Jun) from a very glancing interaction with a filament eruption CME from 23 Jun. A further enhancement is then possible on day 4 (29 Jun) from the arrival of any CME from the filament disruption on 25 Jun. This is low confidence however. Otherwise solar winds are expected to remain near background with no notable enhancements forecast. Geomagnetic activity is forecast to be mainly Quiet, with only isolated Unsettled intervals. Perhaps the chance of Active to G1 Minor Storm intervals, mainly with the second of the two CMEs on day 4 (28 Jun).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to be at background levels, with a slight but declining chance of exceeding

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the S1/Minor Storm threshold should any notable flares occur from any of the three large sunspots now around the western limb.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	1	1	5	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	Yes	60	60	60	60
Very Active	R3 to R5 X	No	10	10	10	10

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	10	5	5	5
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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